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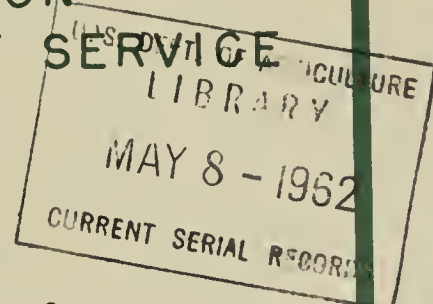
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# TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION  
U.S. DEPARTMENT OF AGRICULTURE · · FOREST SERVICE



No. 620

## Two Prescribed Summer Fires Reduce Abundance and Vigor of Hazel Brush<sup>1/</sup> Regrowth

In the spring of 1960 a prescribed burning experiment was begun on the Cutfoot Experimental Forest located in north-central Minnesota. The study was installed beneath a stand of 90-year-old red pine which has an understory of brush. One of the main purposes of the experiment was to compare dormant season with summer burning, and annual with biennial burning. Two annual summer fires have more effectively reduced the vigor and amount of brush than any other burning combination.

Dormant season burning so far has been done only in the spring, either in late April or early May. Summer burning in 1960 was done in July and early August, while in 1961 it was completed on June 6, about 3 weeks after the onset of the growing season which is normally about 15 weeks long.

The brush population per acre before burning for all treatments combined was somewhat variable but averaged 22,800 stems for all height classes; 22,000 stems 12 inches or more in height; and 52.0 cubic feet, which includes the total cubic-foot volume of the stems, branches, and bark of all brush.

In the fall of the year following the second annual fire, measurements were made of all regrowth. The results are given in Table 1.

Table 1.--Number of stems and cubic-foot volume per acre of new growth after prescribed burning as compared to unburned controls.

Season and frequency of burning <sup>1/</sup>	:	Number of stems in thousands	:	Volume in cubic-feet
	:		:	
	:	Total	:	12 inches or more in height
Once burned				
Spring		53.0		52.2
Summer		50.2		50.5
Twice burned				
Spring		81.0		56.5
Summer		17.6		6.0
Unburned		19.9		19.8
				37.0

<sup>1/</sup> Eight observations for each once-burned treatment, four observations for each twice-burned treatment. Analysis of variance run only on total number of stems, omitting the unburned treatment. Spring vs. summer significant at .05 level; summer once vs. summer twice significant at .05 level.

<sup>1/</sup> Corylus cornuta and C. americana. The experiment also contains minor quantities of adler (Alnus spp.), willow (Salix spp.), and juneberry (Amelanchier spp.).

Fires easily killed the above-ground portions of all brush regardless of the season of year or frequency of burning. Sprouting or resprouting of the brush followed, and the abundance and massiveness of the sprouts appears to be related to the season and frequency of burning.

Two annual summer fires have reduced the total number of stems per acre below that contained in the original stand (Table 1). All other burning treatments have produced at least twice as many sprouts per acre as there were stems in the original stand; in the case of two annual spring fires, there are nearly four times as many sprouts as original stems.

The vigor and volume of regrowth is also affected by the season and frequency of burning, but the picture is complicated because the summer burns have not had as much time for regrowth as the dormant season burns. For example, the twice-burned spring treatment had 56.5 thousand stems 12 inches or more in height and 2.9 cubic feet of volume per acre at the end of the growing season after the second fire, whereas the twice-burned summer treatment had only 6.0 thousand stems 12 inches or more in height and 0.3 cubic foot of volume per acre. However, the spring treatment had a full growing season, while the growing period for the summer treatment was about 3 weeks less than the normal 15-week season. Similarly, the once-burned spring treatment had 8.9 cubic feet per acre two full growing seasons later while the once-burned summer treatment had 2.4 cubic feet per acre about 1-1/3 growing seasons later.

Two annual summer fires have completely eliminated hazel sprouts from several of the milacre subplots on which measurements were made, a result not achieved by the other treatments shown in Table 1. This effect on distribution, together with the data given on number and vigor of sprouts, suggests that subsequent annual summer fires will continue the deterioration and bring about the eventual elimination of hazel brush.

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